

CLINICAL EXPERIENCES WITH MECKEL'S DIVERTICULUM AND OTHER VESTIGES OF THE OMPHALOMESENTERIC DUCT.*

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My observation of the congenital anomalies mentioned in the title of this paper is limited to the following instances:

CASE I. *A Meckel's diverticulum on the mesenteric side of the ileum.*—I reported in 1896¹ a case of diverticulum, arising from the ileum a few inches above its entrance into the cæcum, seen while assisting Dr. L. W. Steinbach in an abdominal operation. This diverticulum was an inch and a-half long, with a base about half an inch wide, and tapered to a rounded end like the finger of a glove. It was connected with the gut at its mesenteric border and was attached to the mesentery or developed upon it. It was not the seat of any inflammatory action and its point was directed upward,—that is, away from the cæcal end of the ileum. It had nothing to do with the condition for which operation was done, which was obstruction due to old inflammatory adhesions about the colon near the cæcum.

CASE II. *Fatal strangulation of the intestine by cord consisting of obliterated omphalomesenteric vessels.*—About ten years ago I saw a middle-aged man, with Dr. H. A. Stout, of Wenonah, N. J., dying with great distention of the abdomen from intestinal obstruction of five days duration. We prepared for immediate operation, but the man died just after he was placed upon the operating-table.

The autopsy showed a loop of bowel encircled by a thin cord of fibrous tissue, looking like the white string used for tying up parcels. This cord was about thirteen centimetres long, and

* Read before the Philadelphia Academy of Surgery, March 5, 1906.

¹ ANNALS OF SURGERY, XXIII, 1896, p. 612.

extended from the front wall of the abdominal cavity to the mesentery above the point of strangulation of the bowel. From another part of the bowel hung a pedunculated mass, four and a-half centimetres long. The cord ran through an opening in this appendage, as through a pulley. The appendage arose from the intestine opposite the mesentery, but had no lumen. The specimen was exhibited to the Philadelphia Pathological Society on October 28, 1897. Dr. David Riesman² considered the cord to be the obliterated vitelline, or omphalomesenteric, vessels.

CASE III. *Strangulation of the ileum by a Meckel's diverticulum (a remnant of the omphalomesenteric duct), relieved by operation.*—A boy, four and a-half years old, was brought to me by Dr. H. J. Butte on January 8, 1906, with a history of unrelievable intestinal obstruction. He had complained of pain in the abdomen for four days previously, which he attributed to a kick by another small boy. Vomiting had occurred promptly and was accompanied by absolute constipation. There had been no previous abdominal crises in the history of the case. At the time of admission the temperature, pulse and respiration of the boy were practically normal.

After two or three hours' observation, an incision was made near the middle line of the abdomen, extending from an inch above the umbilicus to a point two inches above the pubes. The intestines were markedly distended and congested. About three feet from the ileocæcal valve a slender diverticulum of the ileum was found. Its diameter was less than that of the normal vermiform appendix. Its end was a mere fibrous cord attached to the abdominal wall near the umbilicus. The structure was distended at its middle into a sac similar to that which is sometimes seen in the appendix when it is inflamed. Between this sac and the ileum there was a patent tube lined with mucous membrane. There was evidence of inflammation of these structures. The ileum a short distance from the point of origin of the diverticulum was tightly strangulated by the passage of the diverticulum and its fibrous continuation across it. A deep groove was thus made in the portion of the bowel opposite the mesentery, similar to

² Meckel's Diverticulum and the Omphalomesenteric Duct, University Medical Magazine, June, 1898.

that often seen in cases of tightly-strangulated hernia at the femoral or inguinal ring.

The cord-like end of the diverticulum was detached from the belly wall, and the diverticle itself was ligated near its ileac attachment and removed. The groove made in the gut, thus relieved from pressure of the tense band, was so dark that I feared that perforation from sloughing would occur. I therefore turned in the suspicious portion by a series of Lembert's sutures. The mesenteric glands were very large, and the veins in the mesentery greatly distended and black, as though actual thrombosis had occurred. There were a few flakes of lymph on the surface of the bowels, but no distinct peritoneal inflammation existed. An attempt was made to bury the stump of the diverticulum after its mucous membrane had been sterilized with a drop of undiluted carbolic acid. If my recollection is correct, I finally abandoned the endeavor to bury it, because of the tension made on the wall of the gut by the sutures, which had to be placed so near those used to turn in the constricted area. When I made the abdominal incision, which was near the middle line, I had to avoid on the inside of the belly-wall a white fibrous cord, which was probably the remains of the right hypogastric artery or the urachus.

For a good many days the patient's conditions was rather critical, with high temperature and a weak, intermittent pulse. A movement of the bowels was obtained on the day after operation. Some days afterward the stools became exceedingly offensive and suggested the possibility of there having occurred some sloughing at the point of former strangulation. The convalescence, however, continued satisfactorily, and at the end of a little over three weeks he was discharged from further surgical observation.

CASE IV. *A Meckel's diverticulum found at autopsy.*—Within the last week, I have obtained a specimen, from a patient, whom I treated at the Polyclinic Hospital for traumatic rupture of the bladder and fracture of the pelvis. He died a month after injury from hæmorrhage occurring from duodenal ulcer.

At the autopsy, made by Dr. John M. Swan, a diverticulum was discovered, about four inches long. At its origin it is about the size of the ileum. It resembles in shape the finger of a glove.

It was situated about two feet from the ileocæcal valve. The man's death was in no way dependent upon the existence of the anomaly.

CASE V. *A possible instance of persistent, though modified, omphalomesenteric structures.*—In 1895 I exhibited to the Section on General Surgery of the College of Physicians of Philadelphia³ a pedunculated myxoma of the abdominal cavity. While operating on a very large umbilical hernia in a woman, I found among the intestines in the sac a translucent tumor as large as a pea. It had a long thread-like translucent pedicle descending into the abdomen. The growth was not attached to the hernial sac or its contents. The slender stalk was pulled out of the opening in the belly-wall till a foot or more was in my hands. Its lower attachment was not revealed. The tumor and a part of its foot-stalk were excised.

Dr. W. M. L. Coplin examined the specimen and pronounced it a myxoma. It was covered by epithelium, most of the cells of which were flattened, though some were more rounded in contour. The pedicle contained a single artery and vein, but no nerve-fibre was evident.

I have thought that perhaps these structures might have been the remains of the omphalomesenteric vessels, which had become free at the umbilical end and by modification had been transformed into the pedunculated tumor.

The surgical lesions liable to result from congenital persistence of the omphalomesenteric duct, in whole or in part, should be borne in mind by operating surgeons. This tubular structure, leading from the primitive intestine to the vitelline, or yolk sac, is usually obliterated in the second month of embryonic life. It may, however, remain patulous in the fœtus and cause a congenital intestinal fistule at the navel in the child after birth. This condition is similar in origin to the urinary fistule at the navel, due to an unobliterated urachus.

In other cases the umbilical portion alone may fail to undergo embryonic obliteration and leave a pouch at, and inside of, the navel lined with mucous membrane. Occasionally, and

³ ANNALS OF SURGERY, XXIII, 1896, p. 295.

perhaps more frequently the intestinal end remains open and gives rise to a Meckel's diverticulum of the intestine.

In still other cases the two ends of the duct may undergo the normal disappearance, and leave an unobliterated tube, or cyst, in the middle region; or the entire duct may disappear, leaving, however, a simple fibrous cord, representing the omphalomesenteric blood-vessels.

Various degrees of involution modify these conditions, and quite an array of surgical lesions needing operative treatment result therefrom.

Many cases of strangulation of the bowel, supposed to be due to old inflammatory adhesions are doubtless due to vestiges of the omphalomesenteric duct resembling inflammatory bands. Fistule at the navel, supposed to be caused by a sloughing umbilical hernia, is sometimes a persistent duct. The diagnosis is not very difficult, if the possibility of the rarer condition be remembered.

A diverticulum may become the seat of ulceration and perforation, like the vermiform appendix, from pyogenic or typhoid infection. It may be the cause of intussusception, and may be the whole, or a part, of the content of a hernial sac.

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